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Patent Abstracts of Japan

PUBLICATION NUMBER : 2000353737
PUBLICATION DATE : 19-12-00

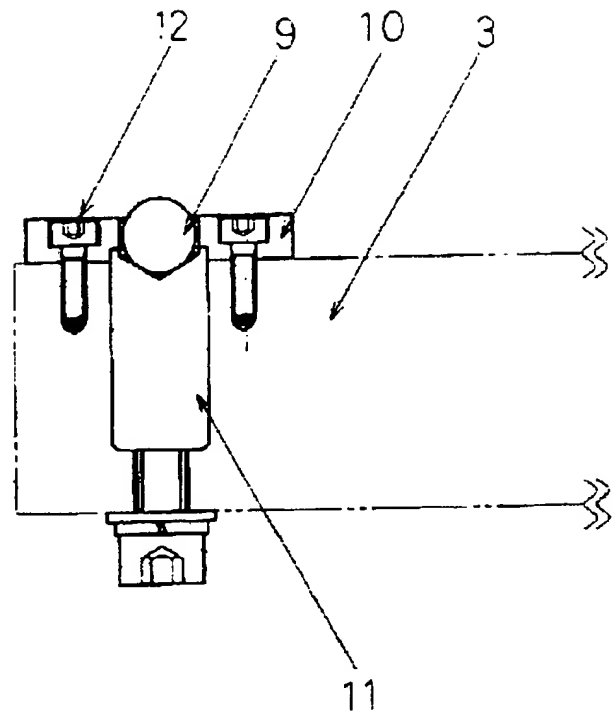
APPLICATION DATE : 14-06-99
APPLICATION NUMBER : 11166822

APPLICANT : TORAY IND INC;

INVENTOR : FUKUYA TOSHIO;

INT.CL. : H01L 21/68

TITLE : DEVICE FOR ARRANGING
SUBSTRATE



ABSTRACT : PROBLEM TO BE SOLVED: To eliminate sliding during arrangement of substrates by making a part of a substrate holding part in contact with a substrate to be spherical and rotatable.

SOLUTION: In a substrate holding part, a part in contact with a substrate 1 is composed of a rolling ball 9. The rolling ball 9 is supported freely rotatably by a ball-supporting pin 11. A part of the rolling supporting pin 11, on which the rolling ball 9 is placed, is made recessed. A top plate 10 is fixed on a substrate supporting arm 3 by a bolt 12, etc., and the top end of the rolling ball 9 is projected from the upper end surface of the top plate 10, and then the top plate 10 is provided with a hole having a size which is not large enough to allow the rolling ball 9 to be removed from the top end surface of the top plate 10, so that the rolling ball 9 does not drop and the ball-supporting pin 11 is fixed surely. Therefore, sliding which occurs during arrangement of substrates can be prevented.

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(D)
+ English
translation
from the
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(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開2000-353737

(P2000-353737A)

(43) 公開日 平成12年12月19日 (2000. 12. 19)

(51) Int.Cl.⁷

識別記号

F I

特許庁 (参考)

H 0 1 L 21/68

H 0 1 L 21/68

N 5 F 0 3 1

審査請求 未請求 請求項の数 6 O L (全 4 頁)

(21) 出願番号 特願平11-166822

(22) 出願日 平成11年6月14日 (1999. 6. 14)

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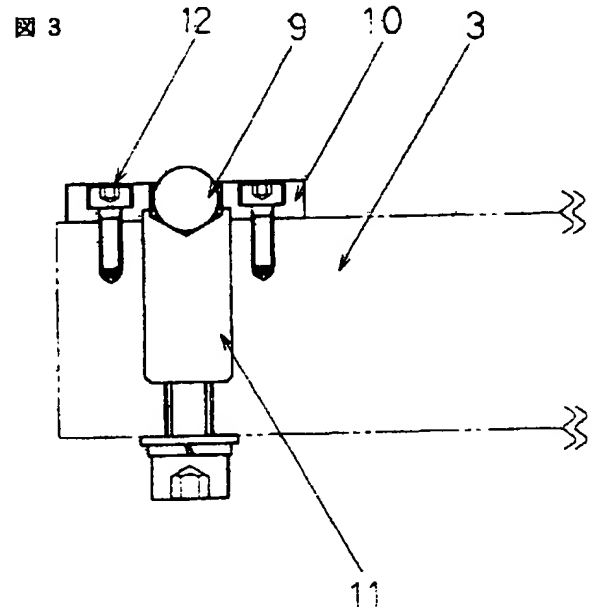
Fターム (参考) 5F031 CA05 GA48 KA02 KA03

(54) 【発明の名称】 基板整列装置

(57) 【要約】

【課題】液晶用カラーフィルターなどに適用する基板支持部材に起因する欠陥が発生することのない基板整列装置を提供する。

【解決手段】基板処理部から搬送されてきた基板を他の基板処理部に受け渡すための基板整列装置において、基板を支持する基板支持部を備え、該基板支持部が少なくとも1つの回転自在の構成を有することを特徴とする基板整列装置。



とが望ましい。

【0018】本発明では、基板支持部材2を回転自在とするものである。好ましくは、球状で、かつ回転自在にすることにより、基板1と基板支持部材2間の摺動を無くするようにしたものである。

【0019】図3は、本発明に係る基板支持部材の一例を示す側面図であり、図4は、図3の上面図である。図3に示す例においては、基板支持部材において、基板1と当接する部分をローリングボール9によって構成したものである。ローリングボール9は、ボール支持ピン11によって回転自在に支持されている。ボール支持ピン11のローリングボール9を載置する部分は、凹状に形成されている。

【0020】10はトッププレートであり、該トッププレート10は、ボルト12などにより基板支持アーム3に固定され、ローリングボール9の上端がトッププレート10の上端面より突出し、かつローリングボール9の落下防止とボール支持ピン11の位置固定の機能を持たせるため、ローリングボール9がトッププレート10の上端面より抜けでない大きさの穴が穿設されている。

【0021】前記の球状の回転体は、耐摩耗性の点から、ガラス転移点温度が143℃以上の高分子材料からなるものであることが好ましい。このような高分子材料としては、PEEK（ポリエチルエーテルケトン）、PFA（ペルフルオロアルコキシ）、PCTFE（ポリクロロトリフルオロエチレン）、PTFE（ポリテトラフルオロエチレン）などが採用できる。

【0022】また、前記の球状の回転体は、直径4mm～30mmの範囲であることが好ましい。

【0023】また、前記の球状の回転体の支持部は、回転体と線接触するよう加工されたものであることが好ましい。基板整列時にローリングボール9が回転することにより、基板と支持部との摺動を防ぎ、基板整列後は、基板が所定の位置に停止させることにある。したがって、ローリングボール9とボール支持ピン11とは点接触ではなく、線接触されていることが好ましい。

【0024】

【実施例】以下、実施例によって本発明を具体的に説明するが、本発明はこれに限定されるものではない。

実施例1

図1に示す基板に熱処理を行う装置において、装置内は110℃以上の高温であるため、装置内の基板整列機構（図2）も高温にさらされる。よって、基板と接触するローリングボール9の材質を連続使用可能温度の高いPEEK（ポリエチルエーテルケトン）にした（直径6mm、およびガラス転移点温度143℃）。

【0025】また、ローリングボール9の固定がルーズであると、基板整列後に基板位置が変わるため、図3に示すように、ボール支持ピン11に円錐状の穴加工を施し、ローリングボール9の動きを規制した。

【0026】このようにすることによって、基板との接触部を球状でかつ回転自在にしたことにより、基板整列時に発生する摺動を発生防止することができた。

【0027】

【発明の効果】本発明の基板支持部材は、基板との接触部を球状でかつ回転自在にしたことにより、基板整列時に発生する摺動を発生防止することが可能である。

【図面の簡単な説明】

【図1】本発明に係る基板整列装置の一例を示す上面図である。

【図2】本発明に係る基板整列装置の一例を示す斜視図である。

【図3】本発明に係る基板支持部材の一例を示す側面図である。

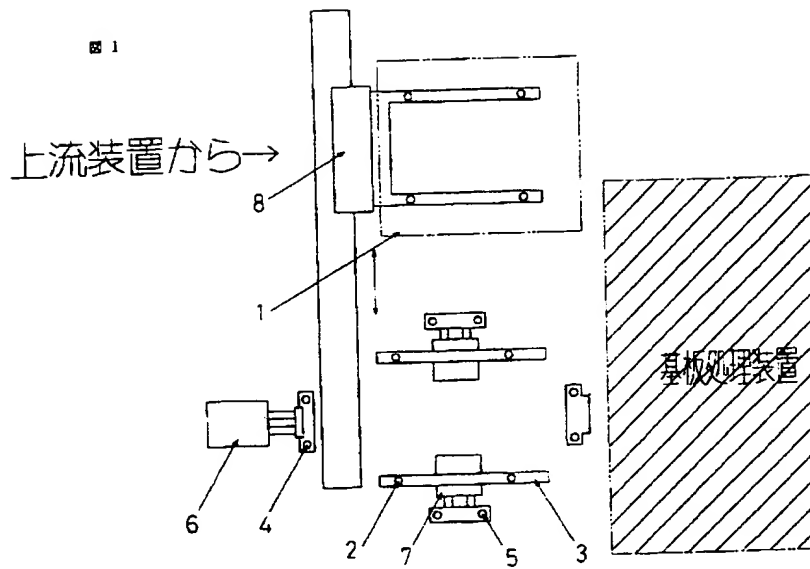
【図4】図3の上面図である。

【図5】従来の基板支持部材の一例を示す側面図である。

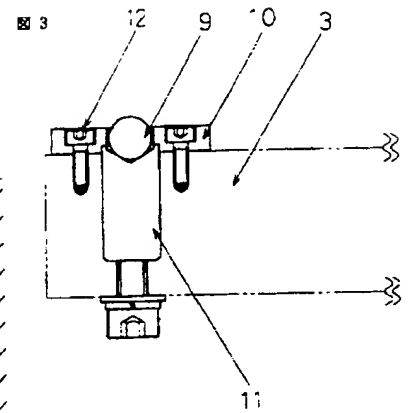
【符号の説明】

- 1：基板
- 2：基板支持部材
- 3：基板支持アーム
- 4：長辺当接部材
- 5：短辺当接部材
- 6：長辺整列用シリンダー
- 7：短辺整列用シリンダー
- 8：移載装置
- 9：ローリングボール
- 10：トッププレート
- 11：ボール支持ピン
- 12：ボルト

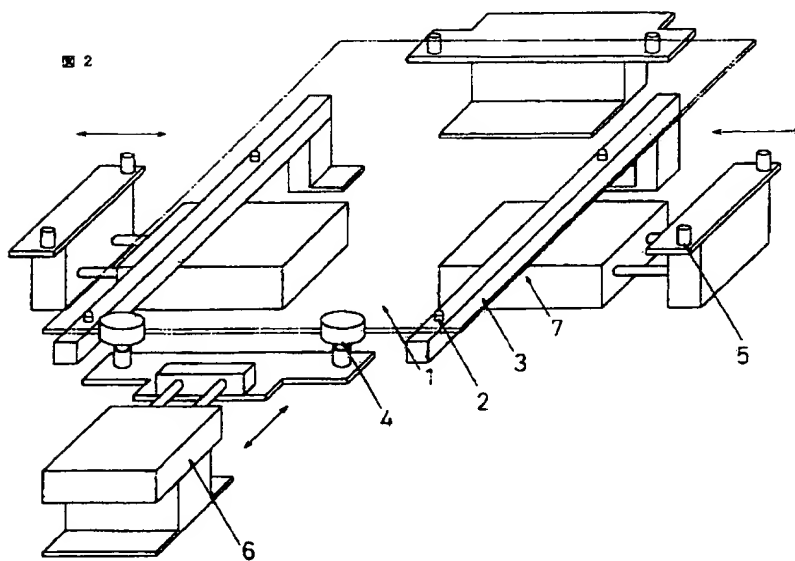
【図1】



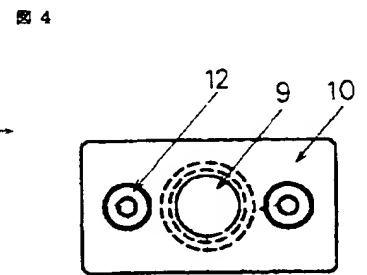
【図3】



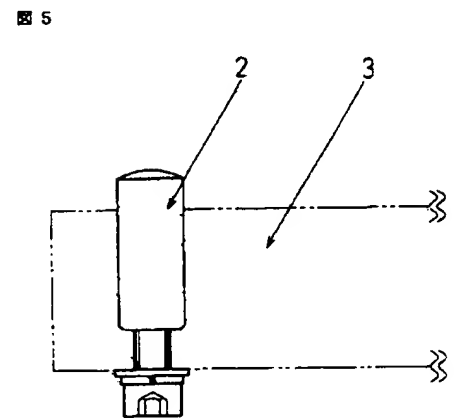
【図2】



【図4】



【図5】



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DETAILED DESCRIPTION

Detailed Description of the Invention]

0001]

Field of the Invention] This invention relates to the substrate array apparatus which improved the configuration of the member which supports substrates, such as glass used for the color filter used for a liquid crystal display component.

0002]

Description of the Prior Art] The substrate array apparatus for delivering substrates, such as glass for liquid crystal displays, to the substrate processing section in the equipment which carries out automatic conveyance is prepared everywhere, and after performing exact positioning, it moves from the former to own stream processing. This aims at performing generating prevention of defects, such as a check, a rack, etc. by a substrate moving in a zigzag direction in the middle of conveyance, and processing highly precise to a substrate.

0003] As a positioning device of a substrate, as shown in drawing 5, a substrate is laid on the substrate support arm 3 on which the supporter material 2 of the shape of a cylinder which consists of a macromolecule member for supporting a substrate protruded, the predetermined part of a substrate is contacted in a positioning member, and the method of carrying out a positioning halt of this is used (the patent No. 2622525 official report etc.).

0004] However, the above-mentioned substrate supporter material cannot solve sliding between the supporter material and substrates which are generated at the time of alignment, but has caused the defect of the blemish by it, and dirt.

0005] The above-mentioned blemish and the defect of dirt are factors which reduce quality, for example, many semi-conductor manufacturing technologies are diverted and the manufacturing installation of the color filter for liquid crystal is a technically serious problem at a detailed pattern formation process.

0006]

Problem(s) to be Solved by the Invention] The purpose of this invention was made in order to cancel the conventional trouble, and it is to offer the substrate array apparatus which the defect resulting from the substrate supporter material applied to the color filter for liquid crystal etc. does not generate.

0007]

Means for Solving the Problem] This invention takes the next configuration in order to attain the above-mentioned purpose. Namely, substrate array apparatus characterized by having the substrate supporter which supports a substrate in the substrate array apparatus for delivering the substrate conveyed from (1) substrate processing section to other substrate processing sections, and having the configuration which this substrate supporter can rotate freely.

0008] (2) Substrate array apparatus given in the above (1) characterized by said substrate supporter being spherical body of revolution.

0009] (3) Substrate array apparatus given in the above (2) characterized by said spherical body of revolution being what glass transition point temperature becomes from polymeric materials 143 degrees C or more.

0010] (4) The above (2) said whose spherical body of revolution is characterized by being the range of 1mm - 30mm diameter, or substrate array apparatus given in (3).

0011] (5) Substrate array apparatus given in either of aforementioned (2) - (4) characterized by processing the supporter of said spherical body of revolution so that line contact may be carried out with body of revolution.

0012] (6) Substrate array apparatus given in either of aforementioned (1) - (5) characterized by being an object for color filter manufacture.

0013]

Embodiment of the Invention] Hereafter, this invention is explained to a detail based on the example shown in a drawing.

0104] Drawing 1 is the plan showing the configuration of the substrate array apparatus concerning this invention, and drawing 2 is the perspective view of the substrate array apparatus in drawing 1.

0105] Moreover, drawing 3 is the side-face sectional view showing an example of the substrate supporter material concerning this invention, and drawing 4 is the side-face sectional view of the conventional substrate supporter material.

0106] In drawing 1, a substrate 1 is carried in by conveyor which is not illustrated and is laid on the substrate support arm 3 on which the substrate supporter material 2 which consists of a spherical macromolecule with a transfer equipment 8 protruded. And as shown in drawing 2, movable [of the cylinder 6 for long side alignment and the cylinder 7 for shorter side alignment which faced each side of a substrate 1 and have been arranged] is carried out, and each side of a substrate 1 is positioned by fastening by press by the long side contact member 4 and the shorter side contact member 5. In order that this long side contact member 4 and the shorter side contact member 5 may also prevent breakage of a substrate 1, it consists of macromolecule resin members (for example, Teflon etc.).

0107] Since a substrate 1 is carried in by conveyor, the transfer equipment 8 shown in drawing 1 cannot be conveyed in an exact location to the substrate processing section. Therefore, although compulsorily positioned by substrate array apparatus, since it is fixed to the substrate support arm 3, sliding generates the substrate supporter material 2 which contacts a substrate 1 in this case between substrates 1. Since this sliding is a cause which causes the defect of a blemish or dirt, it is desirable not to make it generate.

0108] Rotation of the substrate supporter material 2 is enabled in this invention. Sliding between a substrate 1 and the substrate supporter material 2 is lost by making rotation free spherically preferably.

0109] Drawing 3 is the side elevation showing an example of the substrate supporter material concerning this invention, and drawing 4 is the plan of drawing 3. In the example shown in drawing 3, the rolling ball 9 constitutes the part which contacts a substrate 1 in a substrate supporter. The rolling ball 9 is supported free [rotation] by the ball support pin 11. The part which lays the rolling ball 9 of the ball support pin 11 is formed in the concave.

0120] 10 is a top plate, and in order that it may be fixed to the substrate support arm 3 with a bolt 12 etc. and this top plate 10 may give the function of the safety catch of a projection and the rolling ball 9 and fixation immobilization of the ball support pin 11 of the upper limit of the rolling ball 9, the hole of magnitude whose rolling ball 9 is not an omission from the upper limit side of a top plate 10 is drilled. [side / of a top plate 10 / upper limit]

0121] As for the aforementioned spherical body of revolution, it is desirable that it is what a wear-resistant point to glass transition point temperature becomes from polymeric materials 143 degrees C or more. As such polymeric materials, PEEK (poly ethyl ether ketone), PFA (perfluoro-alkoxy), PCTFE (polychlorotrifluoroethylene resin), PTFE (polytetrafluoroethylene), etc. are employable.

0122] Moreover, as for the aforementioned spherical body of revolution, it is desirable that it is the range of 6mm - 30mm diameter.

0123] Moreover, as for the supporter of the aforementioned spherical body of revolution, it is desirable to be processed so that line contact may be carried out with body of revolution. When the rolling ball 9 rotates at the time of substrate alignment, sliding with a substrate and a supporter is prevented and it is in a substrate stopping a position after substrate alignment. Therefore, it is desirable not point contact but that line contact of the rolling ball 9 and the ball support pin 11 is carried out.

0124]

Example] Hereafter, although an example explains this invention concretely, this invention is not limited to this.

1 the equipment which heat-treats to the substrate shown in example 1 drawing 1, since the inside of equipment is an elevated temperature 110 degrees C or more, the substrate in-line mechanism in equipment (drawing 2) is also exposed to an elevated temperature. Therefore, the quality of the material of the rolling ball 9 in contact with a substrate was set to PEEK with high continuous duty possible temperature (poly ethyl ether ketone) (the diameter of 6mm, and glass transition point temperature of 143 degrees C).

0125] Moreover, since a substrate location changed after substrate alignment that immobilization of the rolling ball 9 is loose, as shown in drawing 3, conic hole processing was performed to the ball support pin 1, and the motion of the rolling ball 9 was regulated.

0126] By doing in this way, generating prevention of the sliding generated at the time of substrate alignment was able to be carried out by having enabled rotation of the contact section with a substrate spherically.

027]

Effect of the Invention] The substrate supporter material of this invention can carry out generating prevention of the sliding generated at the time of substrate alignment by having enabled rotation of the contact section with a substrate spherically.

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